



Electric Fence Demonstration

Peter Brook
Dr Samuel Mann
Paul Davies
Otago Polytechnic
peterb@tekotago.ac.nz

1. Introduction

In a previous paper, (Mann *et al.* 2000) the design of a rural networking project was given that made use of existing electric fencing. Progress has advanced to a stage where some working prototypes are nearing completion.

Two major problems remain:

1. the optimum voltage to send digital information
2. a simple cost efficient way to turn the high-voltage spikes off and to quickly ground the electrical wire without arcing prior to the sending of a digital burst.

2. A Demonstration Prototype

At the conference the research team will demonstrate some apparatus that was used to test the protocols that send digital packets down an electric fence. The equipment consists of a master and slave unit, both of which are controlled by an embedded microprocessor at the higher end of the 8051 family. The slave processor board contains a thermometer IC, the DS1620. This chip samples the ambient temperature at regular intervals and sends this value to the slave 8051 when requested via a serial command. The master, when prompted, sends a signal to the slave for the latest temperature. The slave acknowledges the master's request and prompts the temperature IC for a sample temperature then stores this value soon after storage, the slave sends this temperature to the master.

The novel aspect about this master-slave communication on the demonstration apparatus is that it takes place over a metre of electric fencing chord using frequency shift keying. The protocols for such communication have been described in a previous paper and have been verified in the laboratory.

3. Conclusion

It is often necessary to construct a proof-of-concept hardware for a new hardware design. The demonstration that FSK signals can reliably transfer real-world numerical samples like temperature has encouraged the rural networking team and lead to small refinements in the design. A third year BIT student Paul Davies, has done most of the programming and prototype construction. A full working model will be made by the end of 2000.

4. References

- Mann, S., Brook, P., Partridge, B., "A Rural Network Using Existing Fencing", NZJACIT, Vol. 4, No.1, 2000.